

Pulse transformers

IT series with single secondary winding	150
IT series with double secondary winding	153

Pulse transformers. They provide a proper galvanic separation between gate drive circuitry and high voltage path in IGBT, thyristor, triac, power MOSFET and DC/DC converter circuits.

		Voltage-time area [Vµs]							Features								Typical applications					
Pulse transformer	Nominal voltage	0 100 0 0.	Ignition (2000)	current [A	4000	5000 3	1:1	1:1:1	2:1	2:1:1	3:1	3:1:1	PCB	Faston	Galvanic separation	Thyristors, triac and IGBTs	Driving power MOSFETs	Line coupling transformers	DC/DC converters	Power supplies	Home automation systems	Monitoring systems
p. 150	500VAC	0.1					•								•				•		•	•
IT 237	500VAC	0.25	1100				•						•		•	•	•		•	•	•	•
IT 245 p. 150	750VAC	0.1											•		•	•	•		•	•	•	•
IT 255 p. 150	750VAC	250 0.25					•						•		•	•	•			•	•	•
IT 258	750VAC	250	1				•						•		•	•	•			•	•	•
IT 239 p. 150	1000VAC	350 0.25											•		•	•	•			•		
IT 370 p. 150	1000VAC	_	1		4000		•						•		•	•	•			•		
IT 364 p. 150	3000VAC	_				5000	•							•	•	•						
IT 213 p. 153	380VAC	450 0.25						•					•		•	•	•	•	•	•	•	•
IT 312 p. 153	380VAC	0.25	1200										•		•		•	•	•	•	•	•
IT 313 p. 153	380VAC	450	1					•					•		•		•	•	•	•	•	•
p. 153	500VAC	0.025						•					•		•	•	•	•	•	•		•
IT 153 p. 153	500VAC	0.1						•					•		•	•	•	•	•	•		•

			Fea	ature	es							Typical applications										
Pulse transformer	Nominal voltage	0 1000 0 0.6	Ignition of	ime area current [A 3000 1.8	4000		1:1	1:1:1	2:1	2:1:1	3:1	3:1:1	PCB	Faston	Galvanic separation	Thyristors, triac and IGBTs	Driving power MOSFETs	Line coupling transformers	DC/DC converters	Power supplies	Home automation systems	Monitoring systems
IT 233	500VAC	300 0.25																•	•	•		
p. 153 IT 242	500VAC	250 0.1														•		_	_	_		_
p. 153 IT 243		250					_								4							
p. 153	500VAC	0.1						•					•		•	•	•	•	•	•		•
IT 253	500VAC	180 0.25						•					•		•	•	•	•	•	•		•
p. 153 IT 246	750VAC	200							•				•		•	•	•		•	•		•
p. 150 IT 248	750VAC	350 0.25														_			_	_		
p. 150																						
p. 150	1000VAC	_			3500	3			•					•	•	•	•		•	•		
p. 153	500VAC	0.25								•			•		•	•	•	•	•	•	•	•
IT 260	500VAC	200									•		•		•		_	•	•	•	•	•
p. 150 IT 314	380VAC	500	1									•	•					_	•	_	•	_
p. 153 IT 154	500VAC	600										_						•				_
p. 153		300																				
p. 153	500VAC	0.25										•						•	•	•	•	_
p. 153	500VAC	0.1										•	•		•		•	•	•	•	•	•



Pulse transformers IT series

Pulse transformer with single secondary winding





- Galvanic separation of drive and power circuit
- Voltage resistance up to 8kV
- Ignition current up to 3A
- Turns ratio up to 3:1

Approvals



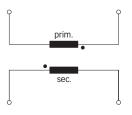
Technical specifications

Nominal operating voltage:	Up to 3000V
Operating frequency:	40kHz max.
	500kHz max. for data transmission
Ignition currents:	0.1 to 3A @ 40°C
Rise time:	0.3 to 2.3µs
Test voltage:	U _p /50Hz/2s max. according to VDE 110b
Max. partial discharge voltage:	1.5 x U _{nom}
Temperature range (operation and storage):	-25°C to +70°C (25/70/21)
Flammability corresponding to:	UL 94V-0 listed materials

Features and benefits

- Galvanic separation.
- Voltage resistance up to 8kV.
- Allows high potential difference voltage scaling.
- Optional grounded shields.
- Vacuum potting.
- Very low partial discharge effects.
- PCB through hole mounting or faston types.
- Custom-specific versions on request.

Typical electrical schematic



Typical applications

- Gate drive circuit
- Power supplies
- Power converters
- Frequency converters
- Switching applications
- DC/DC converters
- Line coupling transformers in high-speed data transmission

IT pulse transformers are designed to offer you galvanic isolation for transformer coupled gate drives. The IT series provides negligible delays and the possibility of voltage scaling. They are available with single or double secondary winding for multiple gate drives. Choosing the IT product line brings you the rapid availability of a standard gate drive transformer. A wide selection on turns ratio, ignition current and voltages are designed to offer you the desired standard product.

Pulse transformer selection table

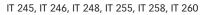
Pulse transformer	Turns ratio	Ignition current	Vo	ltage	Voltage time area	Rise time	Indu	ctance	Resis	stance	Coupling capacitance	•	Output ections	Weight
		l _{ign}	U_{nom}	U_p	V _{0t}	t _r	Lp	L_{str}	Rp	R_s	C _k	- 1	0	
		[A]	[V]	[kV]	[Vµs]	[µs]	[mH]	[µH]	[Ω]	[Ω]	[pF]			[g]
IT 155	1:1	0.1	500	4	480	1	5	85	1.2	1.2	6	02		13
IT 245	1:1	0.1	750	4	500	1.2	8	100	1.48	1.48	10	02		6
IT 237	1:1	0.25	500	2.5	1100	1	25	35	1.9	2.2	50	02		14
IT 239	1:1	0.25	1000	6	300	2.3	3	80	0.9	0.9	5	02		13
IT 255	1:1	0.25	750	4	250	1.1	2.2	40	8.0	0.8	8	02		6
IT 258	1:1	1	750	3.2	250	0.25	2.5	3	0.62	0.75	80	02		6
IT 370	1:1	1	1000	5	4000	0.6	0.3	6	0.16	0.18	40	02		71
IT 364*	1:1	3	3000	8	5000	1.7	1.5	10	0.16	0.14	35		05	220
IT 246	2:1	0.1	750	4	200	0.4	7	35	2.1	1.1	7	02		6
IT 248	2:1	0.25	750	3.2	350	2.2	17	80	3.2	1.6	9	02		6
IT 362*	2:1	3	1000	5	3500	0.4	3	25	2.4	0.3	20		05	360
IT 260	3:1	0.1	500	3.2	200	0.3	12	30	2	0.8	8	02		6

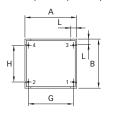
Not suitable for PCB-mounting.

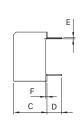
Explanations:

- t_r rise time at given load resistor R and 70% of the output pulse height.
- Lp primary inductance measured at 1kHz (secondary coile open).
- Lstr stray inductance measured at the secondary side, short circuit at the primary side. If there are several secondary coils only one at the time is connected (measuring frequency 10kHz).
- The ignition current is a set peak value where the voltage drop over the coil resistance is still insignificant (mostly below 1V).

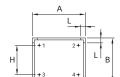
Mechanical data











G

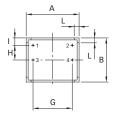
IT 239

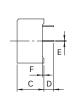
IT 362



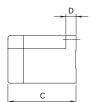


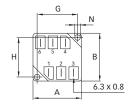
IT 155, IT 237





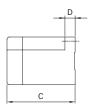


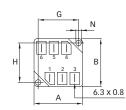




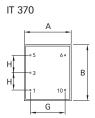


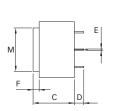
IT 364













Dimensions

Diffictions													
	IT 245	IT 246	IT 248	IT 255	IT 258	IT 260	IT 239	IT 155	IT 237	IT 362	IT 364	IT 370	Tol.
A	17.6*	17.6*	17.6*	17.6*	17.6*	17.6*	27	27	27	50	50	27	±0.2
В	16.7*	16.7*	16.7*	16.7*	16.7*	16.7*	22.5	22.5	22.5	50	50	32.2	±0.2
С	11.3*	11.3*	11.3*	11.3*	11.3*	11.3*	13.7	13.7	13.7	72	60	23.7	±0.2
D	5	5	5	5	5	5	5	5	5	10*	10*	5.5	+1/-0
E	∅0.42	∅0.42	∅0.42	∅0.42	∅0.42	∅0.42	∅0.45	∅0.45	∅0.45			Ø0.8	
F	0.4	0.4	0.4	0.4	0.4	0.4	0.7	0.7	0.7			3.5	
G	15.3	15.3	15.3	15.3	15.3	15.3	20	20	20	42	42	20	±0.2
Н	12.5	12.5	12.5	12.5	12.5	12.5	15	7.5	7.5	42	42	10	±0.2
I								3.5	3.5				±0.2
L	2	2	2	2	2	2	2.5	2.5	2.5				
M												25	±0.2
N										Ø4.2	Ø4.2		

^{*} Tolerance is ±0.1

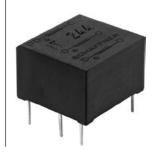
All dimensions in mm; 1 inch = 25.4mm Tolerances according: ISO 2768 / EN 22768



Pulse transformers IT series

Pulse transformer with double secondary winding





- Galvanic separation of drive and power circuit
- Voltage resistance up to 4kV
- Ignition current up to 1A
- Turns ratio up to 3:1:1

Approvals



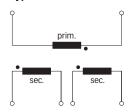
Technical specifications

Nominal operating voltage:	Up to 500V
Operating frequency:	40kHz max.
	500kHz max. for data transmission
Ignition currents:	0.1 to 1A @ 40°C
Rise time:	0.4 to 4.0µs
Test voltage:	U _p /50Hz/2s max. according to VDE 110b
Max. partial discharge voltage:	1.5 x U _{nom}
Temperature range (operation and storage):	-25°C to +70°C (25/70/21)
Flammability corresponding to:	UL 94V-0 listed materials

Features and benefits

- Galvanic separation with secondary winding.
- Voltage resistance up to 4kV.
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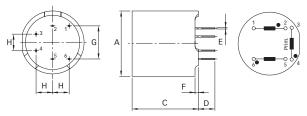
Pulse transformer	Turns ratio	Ignition current	Vo	ltage	Voltage time area	Rise time	Indu	ctance	Resi	stance	Coupling capacitance	Input/Output connections	Weight
		I _{ign} [A]	U _{nom} [V]	U _p [kV]	V _{0t} [Vµs]	t _r [µs]	L _p [mH]	L _{str} [µH]	R _p [Ω]	R_s $[\Omega]$	C _k [pF]		[g]
IT 143	1:1:1	0.025	500	4	800	0.6	15	200	3	3	10	02	14
IT 153	1:1:1	0.1	500	4	600	1.4	9	120	1.5	1.5	10	02	14
IT 242	1:1:1	0.1	500	3.2	250	0.9	2.5	75	0.75	0.75	7	02	6
IT 243	1:1:1	0.1	500	3.2	250	1	2.5	85	8.0	8.0	7	02	6
IT 213	1:1:1	0.25	380	2.5	450	0.4	6.5	20	1.4	1.4	40	02	9
IT 233	1:1:1	0.25	500	4	300	1.3	3	45	8.0	8.0	7	02	13
IT 253	1:1:1	0.25	500	3.2	160	1.3	1.1	45	0.55	0.55	6	02	6
IT 312	1:1:1	0.25	380	2.5	1200	1	21	35	2.4	2.7	30	02	24
IT 313	1:1:1	1	380	2.5	450	0.6	3	6	0.33	0.4	27	02	24
IT 249	2:1:1	0.25	500	3.2	330	4	17	140	3.1	1.5	9	02	6
IT 154	3:1:1	0.1	500	4	600	1.3	75	180	7.5	2.2	9	02	14
IT 244	3:1:1	0.1	500	3.2	200	0.7	15	70	2.8	0.9	9	02	6
IT 234	3:1:1	0.25	500	4	280	1	17	40	2	0.7	9	02	13
IT 314	3:1:1	1	380	2.5	500	1	35	20	1.6	0.7	30	02	25

Explanations:

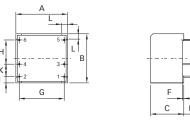
- t_r rise time at given load resistor R and 70% of the output pulse height.
- Lp primary inductance measured at 1kHz (secondary coile open).
- Lstr stray inductance measured at the secondary side, short circuit at the primary side. If there are several secondary coils only one at the time is connected (measuring frequency 10kHz).
- The ignition current is a set peak value where the voltage drop over the coil resistance is still insignificant (mostly below 1V).

Mechanical data



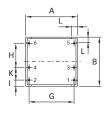


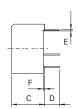
IT 243, IT 244, IT 249, IT 253





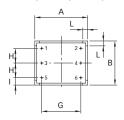


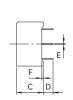






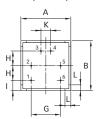
IT 143, IT 153, IT 154, IT 233, IT 234

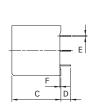






IT 312, IT 313, IT 314







Dimensions

	IT 213	IT 243	IT 244	IT 249	IT 253	IT 242	IT 143	IT 153	IT 154	IT 233	IT 234	IT 312	IT 313	IT 314	Tol.
A	Ø19	17.6	17.6	17.6	17.6	17.6	27*	27*	27*	27*	27*	25.5*	25.5*	25.5*	±0.1
В		16.7	16.7	16.7	16.7	16.7	22.5*	22.5*	22.5*	22.5*	22.5*	25.5*	25.5*	25.5*	±0.1
С	20	11.3	11.3	11.3	11.3	11.3	13.7	13.7	13.7	13.7	13.7	25*	25*	25*	±0.1
D	5	5	5	5	5	5	5	5	5	5	5	5	5	5	+1/-0
E	Ø0.45	Ø0.42	Ø0.42	∅0.42	Ø0.42	Ø0.42	Ø0.45	Ø0.45	Ø0.45	Ø0.45	Ø0.45	Ø0.5	Ø0.5	Ø0.5	
F	1	0.4	0.4	0.4	0.4	0.4	0.7	0.7	0.7	0.7	0.7	0.5	0.5	0.5	
G	10	15.3	15.3	15.3	15.3	15.3	20	20	20	20	20	15	15	15	
Н	5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	±0.2
I		2.1	2.1	2.1	2.1	2.1	3.75	3.75	3.75	3.75	3.75	5.25	5.25	5.25	±0.2
K		5	5	5	5	5						5	5	5	±0.2
L		2	2	2	2	2	2.5	2.5	2.5	2.5	2.5	3	3	3	

^{*} Tolerance is ±0.2

All dimensions in mm; 1 inch = 25.4mm Tolerances according: ISO 2768 / EN 22768